Violence during Pregnancy and Substance Use

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Abstract: Violent incidents were assessed as part of a prospective study of 1,243 pregnant women. Participants were predominantly poor, urban, minority group women. Seven percent (n = 92) of women reported physical or sexual violence during pregnancy. Most of the women (94 percent) knew their assailant. Victims of violence were at greater risk of having a history of depression and attempted suicide, having more current depressive symptoms, reporting less happiness about being pregnant, and receiving less emotional support from others for the current pregnancy. Comparisons of victims and non-victims showed that victims were more likely to be users of alcohol and drugs. In addition, partners of victims were more likely to use marijuana and cocaine. When possible confounders were controlled using multivariable analyses, a woman's alcohol use during pregnancy and her partner's drug use were independently associated with an increased risk of being a victim of violence during pregnancy. Results of this study highlight the importance of assessing exposure to violence during prenatal care, especially among women who are heavy users of alcohol or drugs or whose partners use these substances. (*Am J Public Health* 1990; 80:575–579.)

Introduction

A substantial proportion of women in the general population experience abuse and violence.[1–8] Two recent studies[6,7] indicate that 4 to 8 percent of pregnant women experience abuse during pregnancy and that this problem may be largely unreported to health care providers. Since the risk of abuse is higher for women in young adulthood and this time coincides with women's most active childbearing years,[9] the experience of violence and abuse during pregnancy deserves special attention.

In spite of the prevalence of violence experienced by women, and its damaging impact on women's health and mental health, few studies have attempted to identify the factors associated with violence during pregnancy. One such study found little difference between abused and non-abused pregnant women in race, age, marital status, employment or educational status.[6] Another study[7] found that, compared to non-abused women, women who experienced abuse during pregnancy were of lower socioeconomic status, higher parity, more likely to be single, and had a history of depression or other psychiatric symptoms. Abused women were also more likely to report alcohol use, and a trend in the data indicated that they may also have higher levels of illicit drug use.[7] While this preliminary finding is consistent with previous associations between alcohol and drug use and family violence in the general population,[8] methodological problems such as small numbers of abused women in the sample and reliance on self-reported drug use[10] limit firm conclusions about the role of these factors during pregnancy.

The aims of the present analysis are: to describe the prevalence and patterns of violent incidents during pregnancy; to describe the association between demographic and psychosocial characteristics and violence during pregnancy; to investigate the association between the experience of violence during pregnancy and the use of alcohol and illicit drugs by pregnant women and their partners; and to investigate the association between the experience of violence during pregnancy and newborn outcomes.

Methods

Sample Recruitment

Subjects were consecutively recruited from July 14, 1984 through June 30, 1987 in the Women's and Adolescent Prenatal Clinics of Boston City Hospital. Eligible subjects were English- or Spanish-speaking women who were willing to give informed consent for study participation. The protocol was approved by the Human Studies Committee of Boston City Hospital. Subjects were protected from the use of data for criminal prosecution by a Writ of Confidentiality obtained under Title 42 of the United States Code Section 242A.

Assessment of Participants

All participants were interviewed during the prenatal and postpartum period by a trained bilingual interviewer. To minimize attrition, participants were paid $10 for each interview. The first interview assessed violent incidents occurring in the time period from three months prior to the calculated day of conception through the day of the interview. The postpartum interview determined violent incidents from the time of the previous interview through the time immediately prior to the delivery of the baby. Violent incidents were ascertained by asking the following question, "Were you physically threatened or abused, or were you involved in any fights or beatings?" The respondents were then asked to "describe what happened," and probed to find out whether the assailant was known to the victim, the type of injury, whether they had seen a doctor, and whether they were hospitalized overnight. Victims of violence were defined as those women who experienced physical or sexual violence during their pregnancies. Verbal threats or emotional abuse were not included as an episode of violence in this analysis.

A close-end, forced-choice interview elicited sociodemographic characteristics and the timing and frequency of the use of cigarettes, alcohol, marijuana, cocaine, and other illicit psychoactive substances prior to and during pregnancy. Data on drug and alcohol use were obtained for the same time periods as were data on episodes of violence. Participants were asked to furnish urine samples at the time of each interview and were informed that their urine would be assayed for "marijuana metabolites and prescription and nonprescription drugs," but that these results would remain confidential and not become part of their clinical record. The

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use of other substances such as alchohol and other drugs was ascertained by self-report alone. Urine assays were conducted by Enzyme Mediated Immunoassay Technique (EMIT),[11] and positive results were confirmed by Mass Spectrometry/Gas Chromatography for cocaine metabolites and by High Pressure Liquid Chromatography[12] for marijuana metabolites. Use of these drugs was determined by both positive self-report or positive urine assay. A full description of the procedure for the urine assays has been published elsewhere.[13]

During the prenatal interview, respondents were also asked to report whether their partners used alcohol, marijuana or cocaine. Quantity measures of partner's drug use were also asked but proved to be difficult for the women to answer and were therefore not included in the analysis.

Life stress was measured by the Life Experiences Survey (LES) whose reliability and validity has been demonstrated.[14] For this analysis, life stress was measured by the Negative Life Events subscale of the LES, which is a summary scale of the number and negative effect of life events experienced in the past year.

Depressive symptoms were measured by the Center for Epidemiological Studies—Depression Scale (CES-D)[15] whose validity and reliability for the CES-D have been demonstrated and reported.[15–22] Past history of depression and suicide were measured by asking respondents, "In your lifetime, have you had two weeks or more during which you felt sad, blue, depressed, or when you lost all interest and pleasure in things that you usually cared about or enjoyed?" History of suicidal feelings and attempts were assessed by asking "Has there ever been a period of two weeks or more when you felt like you wanted to die?" and "Have you ever attempted suicide?"

Following delivery, trained record reviewers, without knowledge of the hypotheses of this analysis, abstracted medical records using a precoded protocol, which documented participants' reproductive and general medical health histories.

Statistical Analysis

Odds ratios and 95% confidence intervals (CI) were used to compare victims of physical or sexual violence during pregnancy to non-victims of violence on demographic, medical and psychosocial characteristics and on drug and alcohol use.[23] Least square multiple regression was used to determine the association between neonatal growth parameters and violence during pregnancy while controlling for potentially confounding variables.[24] Multiple logistic regression was used to assess the multivariable relationship between violence and drug use. Adjusted odds ratios and 95% CI were calculated from this model.[23]

Results

Sample Characteristics

Eighty-six percent of 1,932 eligible women participated in the study; 144 (8 percent) refused to participate and 124 (6 percent) who had agreed to participate left after the prenatal clinic visit prior to the interview. Non-participants were more likely than participants to be White (19 vs 9 percent), older (26 years vs 24 years), cigarette smokers (41 vs 34 percent) or third trimester registrants (40 vs 22 percent). The two groups were similar in parity, use of alcohol, marijuana, cocaine, or other drugs.

Seventy-eight percent (n = 1,303) of the women who were recruited completed the study. Of the 361 women who were lost to follow-up, most (81 percent) delivered in another hospital or had an elective abortion. Sixty (5 percent) of the 1,303 who completed the study were excluded from the analysis because of a missing medical record review or infant examination, leaving 1,243 completed cases. Completed cases (n = 1,243), when compared to those lost to follow-up or with incomplete infant data (n = 421), had similar sociodemographic characteristics and similar patterns of alcohol, marijuana, cocaine, and other drug use.

The sample of 1,243 participants with complete data reflects the low income (48 percent with household income ≤ $500 a month), predominantly ethnic minority (North American Black = 55 percent, foreign-born Black = 19 percent, Hispanic = 18 percent, White = 8 percent), single (62 percent), and primiparous (55 percent) population served at the prenatal clinic. While 16 percent of the participants were less than 18 years old, 66 percent were between 19–29 years of age.

Violence during Pregnancy

Seven percent (n = 92) of women in the study reported physical or sexual violence during pregnancy. An additional 3 percent of the study population (n = 37) reported incidents of violence in the three months prior to the pregnancy but not during their pregnancy. Less than one percent (n = 11) of women in the sample (12 percent of victims) reported incidents both three months before and during pregnancy.

Sixty percent of the victims were subjected to one incident of violence during pregnancy, 25 percent were victimized twice and 15 percent experienced three or more incidents. More incidents occurred in the first trimester (55 percent) than in the second (40 percent) or third trimesters (25 percent). Most of the women (94 percent) knew their assailant. Thirty-six percent of the victims saw a doctor for at least one of the violent incidents during pregnancy and 10 percent were hospitalized overnight as a result of one of these incidents.

Comparison of Victims and Non-Victims

Compared to non-victims (Table 1), victims had higher relative odds of identifying themselves as White (7 vs 15 percent), born in the US (65 vs 76 percent), and single (62 vs 75 percent). They were also more likely to be on Medicaid (60 vs 76 percent), to have had a history of sexually transmitted diseases (17 vs 30 percent) and to have had an elective

TABLE 1—Relative Odds of Selected Demographic and Medical Differences of Victims of Violence Compared to Non-victims (n = 1,243)

Variable/Comparison	Relative Odds	95% Confidence Interval
Ethnicity		
North American Black/Other Black	1.56	0.81, 3.00
North American Black/Hispanic	1.54	0.78, 3.03
North American Black/White	0.48	0.25, 0.92
North American Black/Other	0.75	0.37, 0.54
Marital Status		
Living with Partner/Married	1.86	0.80, 4.34
Single/Married	2.52	1.28, 4.97
Born in the US/Born outside	1.70	1.04, 2.79
Medicaid Recipient/Non-recipient	2.12	1.23, 3.66
History of Sexually Transmitted Disease*/None	2.13	1.33, 3.41
Prior Elective Abortion/None	1.68	1.01, 2.57

*Syphilis, gonorrhea, herpes, pelvic inflammatory disease, chlamydia

abortion (38 vs 50 percent). The two groups had similar levels of educational attainment (42 percent of victims had 12 years of school vs 39 percent of non-victims), mean ages (x = 24 for each group), employment status (24 percent not employed in each group) and parity (53 percent of victims were primiparas vs 52 percent of non-victims).

Victims of violence differed from non-victims on a number of psychosocial measures (see Table 2). Compared to non-victims, victims were at greater risk of having reported a history of one or more depressive episodes (33 vs 56 percent) and to have attempted suicide (5 vs 17 percent), reporting unhappy feelings about their current pregnancy (20 vs 33 percent), perceiving their partners (11 vs 22 percent) and families (14 vs 27 percent) as unhappy about their pregnancy, and feeling a lack of support during their pregnancy (13 vs 36 percent). Victims reported more depressive symptoms (mean difference = 5.6, 95% CI = 3.35, 7.86) and greater numbers of negative life events in the past year (mean difference = 13.16, 95% CI = 10.01, 16.31).

These demographic and psychosocial characteristics did not differ between women who experienced one compared to two or more incidents of abuse during pregnancy (data available on request to authors).

Drug Use among Victims and Non-victims

Women were divided into three categories (nonusers, light users, and heavy users) based on their frequency of use and the number and type of different drugs used during pregnancy. Since we have shown that among marijuana and cocaine users, a positive urine assay is associated with more frequent drug use,[13] we designated women who had a positive urine for either drug and those who self-reported using opiates and/or marijuana or cocaine at least weekly during pregnancy as heavy users. Users of any illicit drug who did not meet the heavy use criteria were categorized as light users.

Victims of violence during pregnancy were at greater risk than non-victims of being heavy users of alcohol (OR = 2.43, 95% CI = 1.71, 3.46) and illicit drugs (OR = 2.68, 95% CI = 1.72, 4.17). A comparison of frequency of use by victims and non-victims showed that victims were heavier substance users in all categories of use than non-victims (see Table 3).

Compared to non-victims, women who were victims of violence had greater odds of having a male partner who was a marijuana (OR = 2.27, 95% CI = 1.46, 3.53) and/or cocaine (OR = 2.35, 95% CI = 1.81, 4.48) user. Further, odds ratios demonstrate a two-fold increase in the use of two or more drugs (OR = 3.2, 95% CI = 1.92, 5.48) by partners of victims when compared to partners of non-victims. Alcohol use by partners was not an increased risk for victims (OR = 1.03, 95% CI = 0.63, 1.69).

Alcohol and drug use did not differ between women who experienced one versus two or more incidents of abuse during pregnancy (data available on request to authors).

A multiple logistic regression (Table 4) shows that the risk of being a victim of violence was associated with a woman's alcohol use during pregnancy and drug use by her partner even when controlling for race, age, marital status, education, and history of violence in the three months prior to pregnancy. While heavy drug use during pregnancy (use of opiates or weekly use of marijuana or cocaine or positive urine assay) was associated with a 39 percent increase in the odds of being a victim of violence, chance cannot be ruled out as the explanation for this finding. Violent incidents in the three months prior to pregnancy have strong predictors of violence during pregnancy.

Birth Outcomes

Multivariable regression analyses were conducted in

TABLE 2—Relative Odds of Selected Psychosocial Differences of Victims of Violence Compared to Non-victims (n = 1,243)

Variable/Comparison	Relative Odds	95% Confidence Interval
History of Depression		
Yes/No	2.60	1.69, 4.00
History of Suicide Attempts		
Yes/No	3.85	2.08, 7.14
Unhappy Feelings about Pregnancy		
Yes/No	1.91	1.21, 3.02
Partner's Unhappy Feelings about the Pregnancy		
Yes/No	2.40	1.37, 4.19
Family's Unhappy Feeling about the Pregnancy		
Yes/No	2.62	2.29, 5.73
Little or No Emotional Support During the Pregnancy		
Yes/No	2.30	1.37, 3.86

TABLE 3—Relative Odds of Frequency of Psychoactive Substance Use of Victims of Violence Compared to Non-victims (n = 1,243)

Variable/Comparison	Relative Odds	95% Confidence Interval
Maximum Average Daily Alcohol Use		
< 1 Drink/None	2.06	1.24, 3.44
1–2 Drinks/None	5.34	2.30, 12.40
2+ Drinks/None	5.15	2.14, 12.41
Frequency of Marijuana Use[a]		
< 1× a Month/None	1.98	0.81, 4.81
Monthly/None	2.13	0.93, 4.91
Weekly/None	2.56	1.53, 4.29
Frequency of cocaine use[1]		
< 1× a Month/None	1.67	0.70, 4.03
Monthly/None	2.69	0.90, 8.02
Weekly/None	2.91	1.56, 5.44

[a]Based on self-reported data only.

TABLE 4—Results of Multiple Logistic Regression Analysis on Experience of Violence During Pregnancy (n = 1,153)

Variables	Relative Odds	95% Confidence Interval
Average daily alcohol use (2 drinks/day vs none)	1.87	(1.24, 2.80)
Average daily alcohol use 1 drink/day vs none)	1.37	(1.12, 1.67)
Heavy illicit drug use	1.39	(0.79, 2.46)
Light illicit drug use	0.87	(0.36, 2.12)
Partner's alcohol use	1.41	(0.82, 2.43)
Partner's illicit drug use (2 or more vs none)	2.26	(1.19, 4.30)
Partner's illicit drug use (1 vs none)	1.51	(1.09, 2.07)
White vs US Black	1.95	(0.97, 3.93)
Foreign-born Black vs US Black	0.86	(0.41, 1.77)
Hispanic vs US Black	1.02	(0.49, 2.11)
Other race vs US Black	0.72	(0.20, 2.59)
Age (30 years vs 18 years)	0.90	(0.51, 1.60)
Marital status (married vs single)	0.60	(0.29, 1.23)
High school graduate vs not	1.12	(0.67, 1.85)
Violent incidents—3 months prior to pregnancy	5.87	(2.73,12.60)

order to investigate the relationship between violence during pregnancy and birthweight, infant length, head circumference, and gestational age. Each regression model included ethnicity, age, pre-pregnancy weight, weight gain during pregnancy, parity, number of prenatal visits, history of sexually transmitted diseases, marijuana use, cocaine use, alcohol use, opiate use, and cigarette use. Once confounders were controlled, the association of violence to birth outcomes, while generally in the expected direction, was weak: birthweight: −19 g, (95% CI = −115, 78); length: 0.15 cm, (95% CI = −0.68, 0.38); head circumference = −0.14 cm, (95% CI = −0.48, 0.19); gestational age: 0.13 weeks, 95% CI = −0.29 to 0.55).

Discussion

The findings of this study support previous reports on the prevalence of violence during pregnancy.[6,7] Of greater importance are the results which provide evidence of a strong relation between violence during pregnancy and the use of alcohol by the pregnant woman and the use of illicit drugs by her male partner.

A number of previous studies have shown that abused women are at greater risk of using heavier quantities of alcohol and prescription and non-prescription drugs than women who are not abused.[4,7] While the cause and effect relationship between use of alcohol and experience of violence is unclear, there are indications that women who are abused may self-medicate with alcohol, illicit drugs, and prescription medication in order to cope with the violence.[4,5,25] For example, in a review of medical records, Stark, *et al*,[4] determined that increased alcohol and drug use followed the first incident of abuse.

The relation between the male partner's drug use and violence during pregnancy has not received as much attention. In general, among men who batter their female partners, substance use has been found to frequently accompany battering.[7,26–28] One author[29] has suggested that drinking is used by men who batter to disavow their violent behavior and disclaim responsibility for their actions. Findings from the present study indicate that multiple drug use among male partners is independently associated with over a two-fold increase in women's experience of violence during pregnancy. Since this study did not directly investigate whether the assailant was the male partner, it is not possible to identify the perpetrator of violence as the male partner. Anecdotal evidence from the interviews suggests that a large proportion of the perpetrators were male partners, however. Further research is needed to determine whether the use of illicit drugs actually promotes violent behavior, is employed as a culturally sanctioned justification for engaging in violence without taking responsibility for it, or is associated through some third causal factor to violence.

The results of this study indicate that once sociodemographic factors and drug use are taken into account, the experience of violence during pregnancy is weakly, if at all, associated with newborn size or gestational age. It is possible that infrequent but severe injuries are associated with adverse pregnancy outcomes. However, the small number of women reporting such injuries did not allow us to assess this possibility.

A number of important limitations should be considered when interpreting the results of this study. First, the subjects were primarily poor, Black, and Hispanic women living in the inner-city. The prevalence of violence and drug use in other populations may be different. Second, our assessment of abuse was limited because it did not evaluate the full psychological impact of an abusive relationship that typically involves a climate of threat and fear. Third, the assessment of violence through limited questions about current experiences of violence does not allow for an understanding of the causal ordering of the relationship between violence, drug use, and depression. Finally, validity of the assessment of the male partner's drug use may be reduced since it was conducted through the female participant, rather than through direct self-report and/or urine assay from the male partner.

With these limitations in mind, prenatal health care providers should assess women's exposure to violence prior to and during pregnancy. In addition, assessment of psychoactive drug use among women and their partners is critical, since such behaviors may be employed as a marker for risk for violence during pregnancy. Further, the possibility of continued violence against a woman after delivery and the potential extension of this violence to the child have important public health implications. Since violence and drug use reflect a wider set of environmental conditions and psychosocial factors that create a context that is detrimental to a mother's and infant's physical and mental health, prevention and intervention efforts will need to be set within a framework of services to address these needs. Training of health care professionals about the problems of drug abuse and family violence is a critical and necessary first step in early identification and intervention efforts.

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NCI Announces Research Opportunities in Cancer Prevention

The Division of Cancer Prevention and Control (DCPC) of the National Cancer Institute has announced it is accepting applications for the next Cancer Prevention Fellowship Program. Funding permitting, as many as 10 fellows will be accepted for up to three years of training, beginning July 1, 1991. The *deadline* for applications is September 1, 1990.

The purpose of this program is to attract individuals from a multiplicity of health science disciplines into the field of cancer prevention and control. The program provides for:

- Participation in the DCPC Cancer Prevention and Control Academic Course;
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For more details and application catalog, send a postcard or letter with your name and home address to: Douglas L. Weed, MD, MPH, PhD, Director, CPFP, DCPC, National Cancer Institute, Executive Plaza South, T-41, Bethesda, MD 20892. Further inquiries should be directed to Barbara Redding at NCI; (301) 496-8640 or -8641.